



2022

## Increasing Staff Compliance with Routine HCV Screening and Improving Linkage to Care Among Patients Testing Hepatitis C Positive in the Emergency Department

Carson G. Swartz

University of Kentucky, [carson.swartz@uky.edu](mailto:carson.swartz@uky.edu)

[Right click to open a feedback form in a new tab to let us know how this document benefits you.](#)

### Recommended Citation

Swartz, Carson G., "Increasing Staff Compliance with Routine HCV Screening and Improving Linkage to Care Among Patients Testing Hepatitis C Positive in the Emergency Department" (2022). *DNP Projects*. 370.

[https://uknowledge.uky.edu/dnp\\_etds/370](https://uknowledge.uky.edu/dnp_etds/370)

This Practice Inquiry Project is brought to you for free and open access by the College of Nursing at UKnowledge. It has been accepted for inclusion in DNP Projects by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@lsv.uky.edu](mailto:UKnowledge@lsv.uky.edu).

Increasing Staff Compliance with Routine HCV Screening and Improving Linkage to Care  
Among Patients Testing Hepatitis C Positive in the Emergency Department

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing  
Practice at the University of Kentucky

Carson G. Swartz, BSN, RN

Lexington, KY

April 2022

## **Abstract**

**Background:** Hepatitis C virus (HCV) is a blood-borne pathogen that can cause severe liver disease, cancer, and death and is a significant source of morbidity and mortality in the United States. Several academic medical centers including University of Kentucky Healthcare have implemented routine HCV screening for patients presenting to the emergency department (ED) and have discovered a large viral burden amongst patients who are often symptomatic.

**Purpose:** The purpose of this doctoral project is to increase staff compliance, confidence, and education regarding the HCV screening process in an urban, Level I emergency department, as well as to evaluate whether an attempt at increasing patient knowledge of hepatitis C through informative flyers in treatment areas would increase linkage to care and successful follow-up rates after receiving a positive diagnosis. Specific objectives include to 1) increase bedside nurse and ED provider compliance in ordering HCV tests and communicating positive test results and follow-up care information to our patient population, and to 2) disseminate educational materials to patients regarding HCV transmission and complications if left untreated to increase linkage to care rates.

**Methods:** This project is a single-site, multimodal project designed to both examine the impact of an education intervention via informal staff in-services using a pre- and post-survey as measurement, and to utilize a secondary data analysis approach to compare linkage-to-care rates following distribution of educational information to patients. The project examined cross-sectional survey responses obtained from clinical staff in the ED, as well as tertiary data obtained from deidentified patient chart reviews.

**Results:** A total of 49 staff members completed the pre-survey and 48 staff members completed the post-survey following 10 educational in-services. Statistically significant changes were observed in testing compliance ( $p = .028$ ) and reported feelings of confidence with HCV knowledge and testing/ diagnosis ( $p = .016$ ). A relative increase in the number of patients tested was observed in Dec. 2021 and January 2022.

**Conclusion:** Knowledgeable and confident healthcare providers are vital for improving patient outcomes and can be achieved through in-services. Future research should focus on continued staff education, implementation of dedicated patient navigators, and tackling the barriers of successful follow-up.

## **Acknowledgements**

I wish to express my sincerest gratitude and appreciation to several incredible people who have provided guidance, counsel, and nurturing throughout the completion of my DNP project and overall success in the doctoral program. First and foremost, my utmost thanks and gratitude to my clinical mentor, Dr. Patricia Howard. My love for emergency nursing and my ability to flourish as a competent, compassionate bedside nurse is rooted in the dedication you give tirelessly to the field of emergency medicine and to our own department. I remain heavily indebted to the friendship, kindness, and willingness to help that you've shown me both inside and outside of work since we first met eight years ago. I also gratefully acknowledge the support and guidance of Dr. Sheila Melander, Dr. Melanie Hardin-Pierce, Dr. Candice Falls, Dr. Daniel Moore, Dr. Amanda Thaxton-Wiggins, and to all other faculty members at the UK College of Nursing and clinical staff at UK HealthCare for being so generous of their time, expertise, and knowledge. I couldn't have achieved this immense academic milestone without you.

To my dad, sister, brother, Kurt, and countless other family and friends- thank you for your love, patience, and support throughout my life, and for your endless encouragement to go on every adventure, especially this one. To Miles, who is a better person than me even though he's an English bulldog- thank you for the open ears when I felt like talking and the consistent willingness to nap when I didn't.

Lastly, and most importantly, to the greatest nurse I'll ever know and the best source of encouragement throughout my entire life, my mother. There will never be sufficient words to describe the pride and happiness I feel when I look at you and your accomplishments throughout a lifetime career in nursing. I am so thankful for your guidance to pursue this path and to constantly challenge the ideas that will define my career. You have permanently instilled in me the values of persistence, independence, tenacity, hard work, determination, and unconditional love. You have always been my biggest cheerleader and my best friend, and I am thankful every single day that you are my mom. I love you more!

## Table of Contents

Abstract.....	2
Acknowledgements.....	3
Introduction.....	6
Background.....	7
Literature Review .....	10
Purpose .....	12
Theoretical Framework.....	13
Methods .....	14
Design .....	14
Setting .....	15
Sample .....	16
Data Collection .....	16
Data Analysis .....	17
Results.....	18
Sample Characteristics.....	18
Hepatitis C Testing Trends .....	18
Staff Confidence Characteristics .....	19
Staff Knowledge .....	19
Key Themes .....	19
HCV Testing & Linkage to Care Trends .....	20
Discussion.....	20

Implications for Future Research.....	22
Limitations .....	23
Conclusion .....	24
References.....	26
Appendices .....	30
Appendix A: Departmental Letter of Support .....	30
Appendix B: Nursing Letter of Support .....	31
Appendix C: Graduate Medical Education Approval Letter .....	32
Appendix D: Nursing Research Council Approval Letter .....	33
Appendix E: Cover Letter.....	34
Appendix F: IRB Approval.....	35
Appendix G: Survey Tool.....	36
Tables.....	38
Table 1. Sample Population Demographics.....	38
Table 2: ED Staff Survey Responses.....	38
Table 3: Test-Ordering Frequency.....	39
Table 4: HCV Testing & LTC Trends (Oct. 2021- March 2022).....	39
Figures .....	40
Figure 1: Educational Flyer (English) .....	40
Figure 2: Educational Flyer (Spanish).....	40
Figure 3: HCV Best Practice Advisory Actions .....	41

## **Introduction**

Hepatitis C virus (HCV) is a blood-borne disease that causes inflammation and tissue damage in the liver and affects more than 2.4 million people in the United States (CDC, 2018). After adjusting for under-ascertainment and under-reporting, an estimated 50,300 cases of hepatitis C occurred in 2018 alone (CDC, 2018). Oftentimes those infected with hepatitis C are asymptomatic, and in turn do not seek treatment. Acute HCV, if left untreated, can develop into a chronic disease state and lead to liver damage, cirrhosis, liver cancer, and death, and more than half of persons who become infected with HCV will develop chronic infection (CDC, 2018). An all-oral direct-acting antiviral (DAA) medication regimen can result in a virologic cure in most persons in 8-12 weeks. Because HCV symptoms are often vague or absent, the Centers for Disease Control and Prevention augmented testing guidelines to a universal model and now recommend HCV testing for all adults aged  $\geq 18$  as well as all pregnant women during each pregnancy (CDC, 2018). Because the emergency department provides care to a broad spectrum of patients, a significant proportion of whom are deemed high-risk or socioeconomically disadvantaged, an ED-based, routine hepatitis C screening program has been beneficial in the diagnosis and treatment of HCV, especially with the development of newer curative therapies.

A routine hepatitis C screening program has been implemented at several urban emergency departments across the United States in order to better determine HCV antibody and viral load burden. These emergency departments have discovered a high prevalence of undiagnosed HCV cases with a routine screening program and have demonstrated a beneficial and cost-effective way to diagnose patients who would likely not be tested otherwise (Lyons et al., 2016) (White et al., 2016). As of July 2020, the emergency department at University of Kentucky HealthCare (UKHC) has tested over 50,000 patients for hepatitis C, revealing a 9.9%

rate of positivity for the HCV antibody and a 46.1% rate of positivity during confirmatory ribonucleic acid (RNA) testing (Moore, Korosec, Howard, 2020). Subsequent linkage to care following routine HCV testing at UKHC has revealed several barriers to treatment that mimic those defined in the literature from other screening programs, making the follow-up process difficult and often unsuccessful. Our current linkage to care rate at UKHC is 44.5% (Moore, Korosec, Howard, 2020). However, to date, of the 1,730 patients who have tested HCV RNA positive, only 190 patients have initiated DAA therapy, with even fewer achieving a curative sustained virologic response (Moore, Korosec, Howard, 2020). This leaves significant room for improvement in the realms of both patient and provider education as well as follow-up and linkage to care processes.

### **Background**

Hepatitis C causes inflammation of the liver and can present as both an acute and chronic infection. Acute HCV infections are usually asymptomatic, and most do not lead to a life-threatening disease; approximately 30% of infected persons spontaneously clear the virus within six months of infection (World Health Organization, 2021). However, the other 70% of persons go on to develop a chronic hepatitis C infection, with a 15-30% risk of developing cirrhosis within twenty years (World Health Organization, 2021). HCV is bloodborne and is most commonly transmitted through the reuse or inadequate sterilization of syringes and needles by injection drug users, from an infected mother to her baby, via unsafe sexual practices that lead to blood exposure, and less commonly from the transfusion of unscreened blood and blood products (World Health Organization, 2021). Cases of acute HCV infection have increased approximately 3.8-fold over the last decade because of increasing injection drug use and improved surveillance (USPSTF, 2020).



Symptoms of all types of viral hepatitis, including hepatitis A, B, and C are similar and can include jaundice, fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, joint pain, dark urine, and/ or clay-colored stool (CDC, 2020). The incubation period for hepatitis C ranges from two weeks to six months, although approximately 80% of people never exhibit any symptoms during this period (World Health Organization, 2021). Historically, HCV infection has been described as a ‘silent epidemic’. For this reason, few people are diagnosed with HCV when the infection is recent, and for the > 50% of those who develop chronic HCV infection, symptoms often don’t present for decades until after serious liver damage has already occurred. Hepatitis C is diagnosed in two separate steps; an initial anti-HCV antibody serologic test is performed, and if this returns as a positive result, an HCV RNA test is utilized to confirm chronic infection.

Because early diagnosis of hepatitis C can prevent serious liver damage and prevent further transmission of the virus, the U.S. Preventive Services Task Force updated their recommendations for testing to all adults aged 18 to 79 years (USPSTF, 2020). This is consistent with CDC recommendations for testing all adults aged 18 and older at least once, as well as all pregnant women during each pregnancy, people who currently inject drugs and share needles or syringes, people who have ever injected drugs, people with HIV, people who receive maintenance hemodialysis, people with persistently abnormal ALT levels, and prior recipients of blood transfusions or organ transplants prior to 1987 (CDC, 2020).

While the entire United States has suffered from the opioid epidemic for several decades, Kentucky has been particularly affected harshly by illicit fentanyl, methamphetamine, and heroin use, with a 50% increase in drug overdose deaths in 2020 compared to the year prior according to the Kentucky Justice & Public Safety Cabinet (Overdose Fatality Report, 2020). Nearly 2,000

Kentuckians died in 2020 alone due to drug overdoses amid months of unprecedented lockdowns and record unemployment (James, 2021). People who inject drugs, or PWIDs, are at particularly high risk of contracting bloodborne infectious diseases like hepatitis C because of unsafe needle practices. The rate of new hepatitis C cases reported to the CDC among persons aged 18-40 years has increased steadily each year since 2013 to 2.8 cases per 100,000 population in 2019 (CDC, 2021). Injection drug use is the most common risk reported for persons with new hepatitis C virus infection, and increases in HCV incidence, particularly among persons aged 18-40 years, are temporally associated with increases in this risk factor (CDC, 2021). Persons who inject illicit drugs are the group most severely affected by the HCV epidemic, but often the least likely to receive treatment. Among people aged 18-29, HCV increased by 400% and admission for opioid injection by 622% (CDC, 2021). The Appalachian region, including areas of Kentucky, West Virginia, Ohio, and Tennessee, is thought to be at extremely high risk for an infectious outbreak of hepatitis C and HIV; these are all states within UK HealthCare's catchment area, with care provided to patients from these areas routinely. During the 2016 fiscal year, UK Chandler and Good Samaritan emergency departments had a combined 2,247 opioid-related visits and 44 opioid-related deaths, and by fiscal year 2019, those values had nearly doubled to 3,507 visits and 79 deaths, respectively.

A greater understanding of the hepatitis C genome has allowed scientists and drug manufacturers to improve the efficacy and tolerability of HCV treatment with multiple direct-acting antiviral options. These revolutionary medications have transformed the management of HCV and prompted the WHO to set the goal of viral elimination by 2030 (WHO, 2021). Because the early detection of hepatitis C is significant in order to initiate timely treatment that decreases the risk of liver damage and disease, several different screening strategies have been

implemented at healthcare organizations worldwide. Some of these programs have focused efforts for HCV screening on patients in the emergency department setting; the reasoning behind this strategy is the over-representation of at-risk groups in this vulnerable population, including PWID, immigrants, patients with dual-diagnosis conditions, the homeless, prisoners, etc. In 2018, the University of Kentucky joined other academic medical centers across the country by implementing an emergency-department based routine hepatitis C screening program.

### **Literature Review**

The evidence overwhelmingly supports both continued implementation of hepatitis C screening in an emergency department setting while also supporting the unfortunate reality of poor linkage to care and subsequent curative therapy post-HCV screening. Some studies reported a successful linkage to care rate of upwards of 45% (Denniston, Klevens, McQuillan, & Jiles, 2012). However, it is not uncommon for an establishment to report successful follow-up rates of 20% or less (Anderson et. al, 2017) (Franco et al., 2016). A bottleneck effect was displayed in a majority of studies that implemented ED HCV screening, where a significant number of patients tested positive for HCV, a fewer amount were successfully notified of their diagnosis, and even fewer attended at least one follow-up appointment or achieved a sustained virologic response, or SVR (Anderson et. al, 2017) (Lier et al., 2019). One retrospective cohort study even coined this bottleneck effect as the ‘No Show Phenomenon’ of hepatitis C care (Franco et al., 2016).

The University of Kentucky operates the highest volume emergency department-based HCV screening and linkage to care program in the country and has screened over 65,000 patients for HCV since the program began in 2018 (Moore, 2021). Within the first six months of UKHC’s ED-based HCV screening program, 1,459 patients had a positive HCV antibody; 43% of those patients admitted a prior history of IV drug use, and 70% of them were born after 1965.

As of July 2020, UKHC had a 9.9% HCV antibody positive rate, with 46.1% of those patients receiving a confirmatory RNA result. At that time, 44.5% of patients were linked to care. Results in 2021 were similar to that of previous years, with an average HCV antibody positive rate of 8.2%, a confirmatory RNA positive rate of 48.2%. Only 46% of patients were linked to care.

A large proportion of participants are attending at least one follow-up appointment but are not advancing to treatment for a variety of reasons. Several well-defined barriers to HCV follow-up care and treatment exist in the literature. These barriers include stigma, lack of social support, complex treatment regimens, language barriers, and ability to pay (Sublette, Smith, George, McCaffery, & Douglas, 2015). A more detailed examination of the barriers slowing or preventing the progression of HCV treatment revealed that self-reported illicit drug use within the past six months was a significant barrier to treatment (Falade-Nwulia et al., 2019). Other significant barriers included having no insurance and being a white male (Franco et al., 2016).

On the opposite hand, identifiable facilitators to successful linkage to care included patients with a prior diagnosed history of cirrhosis and having access to primary care (Franco et al., 2016). Patients with a coinciding HIV infection for which they were already receiving treatment were also more likely to follow up outpatient (Falade-Nwulia et al., 2019). Although the University of Kentucky has successfully linked 57% of RNA+ patients to care, our institution has only initiated curative therapy in 278 of the 876 patients identified in the UKHC clinic (Moore, 2021). While this is a step forward in preventing severe downstream morbidity and mortality, there is still much room for improvement.

The focus of recent literature has shifted from accumulating evidence to support routine ED-based HCV screening programs to discovering innovative and efficient ways to improve linkage to care for patients to assist them in initiating DAA therapy and achieving an SVR. In

one study conducted at a large medical center in Tel-Aviv, of the 17 patients found to be HCV positive, only three patients expressed interest in treatment during initial phone conversations but never arrived for clinic appointments, and no patients actually received DAA treatment at the end of follow-up (Hour, Horowitz, Katchman, Weksler, Miller, Deutsch, & Shibolet, 2020). This lack of follow-up was attributed to a majority of those patients who were homeless or admitted to using illicit drugs and not having a reliable contact method upon discharge (Hour et al., 2020). At another academic tertiary care emergency department, a non-targeted, opt-out HCV and linkage to care program was implemented, and of the 3.1% of patients who had HCV on confirmatory RNA testing, only 21% were linked to care (Blackwell, Rodgers, Franco, Cofield, Walter, Galbraith, & Hess, 2020).

In-service training of nurses and other healthcare providers plays an indispensable role in improving the quality of patient care, and staff education is crucial for achieving organizational goals (Chaghari, Saffari, Ebadi, & Ameryoun, 2017). In-service training provides an avenue for promoting both the empowerment and competency of employees for the better understanding and completion of specific tasks; in the healthcare realm, this often results in improved patient outcomes and care delivery models. When nurses and providers feel confident in the policies and procedures regarding standards of care, patients will receive refined, transformative care.

### **Purpose**

The purpose of this DNP project was to increase ED nursing and provider knowledge and compliance regarding the routine HCV testing program at UK HealthCare, and to evaluate current follow-up and linkage to care processes for patients testing positive for hepatitis C. The project was completed utilizing both a descriptive, non-randomized design for evaluation, as well as a secondary data analysis. Specifically, this project aimed to examine staff knowledge

surrounding the ED-based HCV testing program before and after an educational intervention provided to nurses and providers, and to examine follow-up and linkage to care rates before and after placing informational flyers across the department for patients to read during wait periods. The project emphasized staff and patient education to allow nurses and providers to feel confident when testing and relaying results to patients, with the eventual goal of increasing the number of patients attending follow-up appointments and initiating direct-acting antiviral therapy. Understanding staff perception of baseline knowledge and daily workflow processes regarding hepatitis C testing can create an avenue for providing effective educational in-services and reinforcing best-practice scenarios and standards of care.

The specific aims of this project were to:

1. Improve both nursing staff and provider compliance with hepatitis C screening and in-person diagnosis and dissemination of follow-up information by holding several informal in-services during pre-shift huddles.

2. Increase patient education regarding the HCV testing and treatment program via dissemination of patient education information in the ED setting, with the eventual goal of increasing patient awareness and inclination to follow up on positive hepatitis C results in the outpatient setting.

### **Theoretical Framework**

The conceptual framework utilized for this DNP project was constructed from Andreas Faludi's Comprehensive Rational Planning Model, a model of the planning process involving several rational actions or steps (Faludi, 1986). The modern CRP theory model gained ground in the 1950s and 60s and is one of the major streams in planning theory. Faludi argues that planning is a decision-making process that should be rational by comprehensively evaluating all possible

actions considering their respective consequences (Faludi, 1986). This model focuses on the steps or activities in selecting alternatives, including defining the problem, listing goals and objectives and their relative values, identifying the alternative that maximizes attainment of goals and objectives, and implementing those alternatives (Faludi, 1986). Results are monitored in a feedback loop-type system where results are utilized to formulate or change new objectives and targets. This approach also considers peripheral influences during the planning process and how they may affect the program (Issel, 2004). Utilizing this model, an ED staff education and training program could be implemented in order to increase nurse and provider familiarity, knowledge, and confidence in the hepatitis C screening program and eventually increase follow-up rates in the outpatient setting.

## **Methods**

### **Design**

This project utilized both a descriptive, non-randomized design with an electronic survey as well as a secondary data analysis. A pre- and post-survey related to HCV screening procedures and follow-up situated in Qualtrics was sent via an electronic, unit-based listserv to clinical staff members in the ED (see Appendix G). After pre-survey data was collected, eight educational in-services lasting approximately 5-10 minutes were held during pre-shift huddles for nursing staff and handoff exchanges for provider staff. A ‘Get Tested, Get Treated’ educational flyer was placed in patient care areas, including the ED lobby, patient restrooms, triage areas, and treatment rooms as a reminder to patients that they would receive HCV testing as a part of standard care in the ED (see Figures 1, 2). Following these educational interventions, a secondary data analysis was conducted in the form of a chart review from an existing medical

record data set of patients testing positive for HCV to determine if a change in testing rates and/or follow-up rates was observed, and to what extent.

### **Setting**

This project was conducted at the University of Kentucky Emergency Department (UKED), a Level I Trauma Center located in central Kentucky. The UKED is a newly constructed, 40,000-square foot facility equipped with state-of-the-art medical equipment. The UKED serves both pediatric and adult patients with approximately 85,000 visits annually and an average of 225 patients every day, although these values were much higher prior to the COVID-19 pandemic. Between Chandler and UK Good Samaritan Hospital, UK HealthCare is the busiest emergency department in the state and among the top 25% in the country. The ED utilizes approximately 120 treatment spaces and comprises three separate areas, including the Makenna David Pediatric Emergency Center, the Level I Trauma Center, and the Adult Emergency Center with an ‘express care’ area for less acute, non-urgent conditions.

UK HealthCare is committed to creating a healthier Kentucky by improving care delivery assessments to continue being a high reliability, high-value organization, and by empowering UK HealthCare staff to create a patient-centered environment where patients feel valued and respected so that they are confident in their care and engage with healthcare providers to focus on their health (UK HealthCare, 2021). This healthcare organization operates under five values that help guide actions, behaviors, and decision-making, including diversity, innovation, respect, compassion, and teamwork (UK HealthCare, 2021). This DNP project encompassed the mission, vision, and value of UK HealthCare’s 2025 Strategic Plan by seeking to improve the health of the patients we serve and by empowering emergency department staff to provide evidence-based, innovative care delivery models to ED patients.



## **Sample**

Approval for this DNP project was obtained from the University of Kentucky Institutional Review Board (IRB) as well as the University of Kentucky Nursing Research Council (NRC) prior to the initiation of the project. After receiving IRB and NRC approval, an email invitation to participate in the project with an enclosed cover letter was distributed via an electronic unit-based listserv to approximately 170 nursing staff members and 60 ED providers, including resident physicians, attending physicians, and advanced practice providers. The email included a secure link to a Qualtrics pre- and post-survey. All subjects were >18 years of age, employed by Emergency Medicine or Emergency Services and provided care to those adult patients who received routine hepatitis C screening as part of standard care in the ED. A secondary study population is a chart review on those adult patients who were screened for hepatitis C in the ED and were HCV positive. Inclusion criteria included: female and male nurses, advanced practice providers (physician assistants and nurse practitioners), resident physicians, and attending physicians on day, mid, and night shifts in the ED, as well as all patients testing positive for hepatitis C via ED screening. Exclusion criteria included: anyone less than 18 years of age, ED ancillary staff, nursing care technicians, or any staff member not willing to complete an online, anonymous survey.

## **Data Collection**

ED staff members, including nurses and providers, were sent an email that included a cover letter entailing details of the study, including study purpose, risks/ benefits, study objectives, principal investigator (PI) contact information, and UK College of Nursing contact information. If participants were agreeable, a survey link within the same email was embedded and participants were taken to a secure Qualtrics survey site. This survey was completely anonymous and could not be traced back to any one employee; it was also voluntary and not a

condition of employment. Permission was received from ED leadership to send the surveys, hold educational in-services, and perform a retrospective chart review.

A de-identified chart review was also performed for patients testing positive for hepatitis C and included data points such as number of unique patients screened, HCV antibody results both positive and negative, RNA results received both positive and negative, and linkage to care rate. Because both the pre- and post-surveys as well as the secondary chart review were anonymous and de-identified, A “Waiver of Documentation of Informed Consent” and Form K “Waiver of HIPAA Documentation” were submitted and approved by the University of Kentucky IRB and Office of Research Integrity (ORI).

### **Data Analysis**

Two datasets were generated from the exported Qualtrics data and descriptive statistics, including means, standard deviations, and frequency distributions were utilized to summarize study variables. HCV testing rates and linkage to care rates were compared before and after educational in-services for ED staff were held. All data analysis was conducted utilizing SPSS version 26 with an alpha of .05 to determine statistical significance. A 95% confidence level was utilized for all statistical analysis. Content analysis of qualitative free-text responses was completed by identifying key themes regarding the HCV testing program. Confidence levels and HCV knowledge items were compared pre- and post-education using the Pearson chi-square tests of association and independent samples tests.

## Results

### Sample Characteristics

A total of 49 surveys were completed pre-educational in-services and 48 completed post-intervention. The majority of participants identified as registered nurses, compiling 63.3% of the pre-education responses and 43.8% of the post-education responses. Response rates were then led by attending physicians (20.4% pre-education, 31.3% post-education), advanced practice providers (10.2% pre-education, 16.8% post-education), and finally by resident physicians (6.1% pre-education, 8.3% post-education). Age, gender, or years of experience were not factored into this study. See Table 1 for results.

A total of 28,914 patients were screened for hepatitis C from October 2021 through March 12, 2022. 607 patients had a positive hepatitis C antibody, and 289 (47%) of those patients had a confirmatory RNA positive test.

### Hepatitis C Testing Trends

When asked what their next action is following the hard stop ‘Best Practice Advisory’ notification on the electronic health record, the majority of participants (36%) stated that they ordered the test and did not inform the patient of the screening program prior to the educational in-service. Following staff education, 45% of participants chose this response. There was also a decrease observed in the number of participants who reported ‘skipping’ or ‘never ordering’ the test from 14% to 10% post-education. These responses among others are illustrated in Figure 4.

Following the educational sessions, testing compliance increased significantly with a *p*-value of 0.028 (see Table 3). Prior to the staff education sessions, 58% of participants responded that they ‘sometimes or always order the HCV test’; that value increased to 79% of participants following education.

### **Staff Confidence Characteristics**

When asked to rate their confidence in telling a patient that they were tested for hepatitis C, a statistically significant change was observed following in-service education with a  $p$ -value of 0.016 (Table 2). While 32.7% of respondents reported feeling ‘not confident’ or ‘somewhat confident’ before the education, this value decreased to 12.5% after the education (Table 2). 46.9% of respondents reported feeling ‘fairly confident’ or ‘very confident’ prior to educational in-services, while 56.3% of participants reported this confidence following the education.

### **Staff Knowledge**

The knowledge questions regarding HCV testing and linkage to care trends were statistically analyzed for the number of correct answers from participants. The pretest ( $n = 48$ ) had a mean (SD) of 1.44 (0.85), and the posttest ( $n = 47$ ) had a mean (SD) of 1.77 (0.81) (Table 2). Between the mean number of knowledge questions answered correctly between the pre- and posttest, there was technically not a statistically significant difference as evidenced by a  $p$ -value of 0.057.

### **Key Themes**

During the post-educational in-service phase, an additional question was added to the survey opening the floor to respondents for suggestions and/ or feedback related to the testing program and DNP project. This allowed respondents to include more information and to express their true feelings and attitudes regarding the program. Twelve respondents included feedback, and some themes identified in their responses are as follows:

- *Making the tests automated or part of the triage navigator in EPIC (EHR)*
- *Unawareness of the existence of the follow-up packet for HCV+ patients before the project implementation*

- *Uncomfortable with/ unaware of the process of HCV screening before the project implementation*

### **HCV Testing & Linkage to Care Trends**

As illustrated in Table 4, hepatitis C testing rates, antibody/ RNA positive results, and linkage to care rates were observed via a de-identified chart review beginning in October 2021 and lasting until the conclusion of this DNP project in March 2022. In November 2021, we had a 45.1% linkage to care rate, which was much greater than the surrounding months and was observed during the time that educational flyers were being posted around the department. We also observed a relative increase in testing rates in December and January during the time in which staff in-services were being held. Unfortunately, the months of December 2021 through February 2022 were defined by relatively lower linkage to care rates than the previous months. Of note, only twelve days of data was available for March 2022 due to the conclusion of this project.

### **Discussion**

The overarching goal of this DNP project was to examine the current state of practice and staff-driven protocols associated with hepatitis C screening and linkage to care and to gauge the influence of a two-fold educational intervention on testing compliance in the emergency department and follow-up rates in the outpatient setting. As described in the literature, in-service training of nurses plays an indispensable role in improving the quality of patient care and improving nursing performance (Chaghari et al., 2017). Previously conducted educational in-services have led to improved provider knowledge and attitudes regarding the specific topic. The assessment and interventions aimed at improving compliance, confidence, and linkage to care are

pivotal in ensuring the continued success of the HCV screening program and refinement of linkage to care for patients.

Because HCV testing is currently considered a standard care procedure in the ED setting, staff members should ideally be ordering the HCV serum test and only informing the patient of the test when prompted. Although not statistically significant, the improvement from 36% to 45% of participants choosing this response supports the idea for continued staff education, as does the statistically relevant increase in testing compliance from 58% to 79%. A non-significant decrease in the number of respondents who ‘skip’ or ‘never order’ the test from 14% to 10% was likely also a positive consequence of staff members being educated on the relationship between the opioid epidemic in Kentucky and our subsequent rise in HCV diagnoses.

Following the educational sessions, hepatitis C testing compliance increased significantly with a  $p$ -value of 0.028. Prior to the in-services, 58% of participants responded that they ‘sometimes or always order the HCV test’, a value that increased to 79% following staff education. The number of participants that reported non-compliance with ordering tests decreased by > 50% following education. Although not statistically significant, an increase in knowledge regarding hepatitis C curability and diagnosis rates was observed at the completion of data collection.

Staff education may also have had a direct impact on reported feelings of confidence with hepatitis C testing and treatment knowledge. When asked to rate their confidence, a statistically significant change was observed following in-service education with a  $p$ -value of 0.016. More respondents reported feeling ‘fairly confident’ or ‘very confident’ following the in-services which was a > 10% increase than previously reported.

The open-ended survey responses provided extremely valuable information and allowed ED staff members to vocalize their true opinions and beliefs and to express any concerns or suggestions that they may have had throughout completion of this project. The key themes identified in the survey supported the idea of staff education, as several people expressed no prior knowledge of the program or the informational packets that *should be given* to every patient that tests HCV+ prior to leaving the department.

Although no statistically significant changes were observed in HCV testing rates and linkage to care trends, a 45.1% linkage to care rate was observed for the month of November. This value was greater than the two months preceding and four months following. Unfortunately, decreased linkage to care rates during the months of December 2021- February 2022. This was likely related to the holiday season or to weather-related complications during the winter months.

### **Implications for Future Research**

This project suggested that an educational intervention can increase confidence and compliance with a staff-driven HCV screening protocol in the emergency department setting. This increase in compliance may have had a direct influence on the number of patients being screened during their ED visit, as well as the number following up in the outpatient setting.

Currently, ED-specific Licensed Clinical Social Workers (LCSWs) at UKHC are responsible for contacting patients to notify them of their hepatitis C infection if they are not made aware of this diagnosis prior to discharge from the hospital. Because the barriers to linkage to care at UK HealthCare are well-defined and mimic those of the literature, implementing dedicated patient navigators may be a focal point for future research. Patient navigators could be solely responsible for linkage to care of persons testing HCV+ and can build a rapport with patients to assist them in feeling at ease throughout the linkage to care and treatment initiation

phase. An additional change to current protocols could be the implementation of HIPAA-protected text messaging as opposed to phone calls to contact patients, as this has been suggested in the literature as a successful strategy for younger, hard-to-reach patients (Collins, Armenta, Cuevas-Mota, Liu, Strathdee, & Garfein, 2016). The implementation of a privacy protected text messaging system could potentially have a positive influence on the ‘No-Show Phenomenon’ gap in care that was highlighted previously.

Perhaps one of the most crucial implications for future research is the profit margin that UK HealthCare could potentially see with continued implementation of the HCV screening program. Fiscal Year 2022-2025 could bring up to an additional \$92.4 million of drug margin to UKHC from the prescriptions associated with a predicted 6,500 RNA+, treatment-eligible patients (Moore, 2021).

### **Limitations**

Unfortunately, several limitations presented themselves throughout the completion of this DNP project. Despite a decent response rate of almost 50, this relative value represented a mere  $\frac{1}{3}$  of eligible ED staff members who completed the pre- and post-surveys. This is probably a result of the phenomenon of ‘survey fatigue’, where respondents become bored or apathetic of the survey process. The survey process was also anonymous, making data analysis difficult when trying to determine if the same staff members took *both* the pre- and post-education surveys. Additionally, three surveys were discarded due to incompleteness.

Another limitation of this study was the inability to impact patients in the outpatient setting, as this secondary data analysis was de-identified and no patient identifiers were available. Several of the barriers to linkage to care that have been previously defined and mimic those of patients at UK HealthCare, including homelessness, inability to pay, stigma, and lack of



support are all influential factors that could be addressed with our patient population in order to increase initiation and compliance with DAA treatment.

The final limitation of this study was the strategy of holding in-services during pre-shift huddles or during times of patient exchange for providers. Although this is the most realistic opportunity to reach the maximum amount of ED staff members at one time, these huddles are often extremely busy and sometimes unorganized, making dissemination of educational materials complicated.

### **Conclusion**

Hepatitis C rates continue to rise at an alarming rate among young adults and millennials, especially in the Appalachian regions of Kentucky, Tennessee, Virginia, and West Virginia, where rates have more than tripled in the last decade. People who inject drugs represent the majority of these new diagnoses and also represent a large demographic of the University of Kentucky emergency department. Hepatitis C screening in the ED setting is a crucial public health service that can not only identify patients who are unknowingly infected with a curable disease known to have progressive consequences if not treated but can also link those patients to an abundance of resources, including pharmacists, GI specialists, infectious disease providers, social work, and care coordinators.

This DNP project ultimately fulfilled the aim of improving nursing staff and provider education, confidence, and compliance with hepatitis C screening and may have had a positive influence on the number of patients following up in the outpatient setting. This project suggested that a non-targeted HCV screening program can potentially be optimized through continued patient and provider education. ED staff members should continue to work collaboratively to

implement effective educational tools and resources to ensure the continued success of the program and improved health of our patient population.

## References

- Anderson, E.S., Galbraith, J.W., Deering, L.J., Pfeil, S.K., Todorovic, T., Rodgers, J.B., Forsythe, J.M., Franco, R., Wang, H., Wang, N.E., & White, D.A.E. (2017). Continuum of care for hepatitis C virus among patients diagnosed in the emergency department setting. *Clinical Infectious Diseases*, 64(11), 1540-46. doi:10.1093/cid/cix163.
- Blackwell, J.A., Rodgers, J.B., Franco, R.A., Cofield, S.S., Walter, L.A., Galbraith, J.W., & Hess, E.P. (2020). Predictors of linkage to care for a non-targeted emergency department hepatitis C screening program. *American Journal of Emergency Medicine*, 38(7), 1396-1401. doi: 10.1016/j.ajem.2019.11.034.
- Chaghari, M., Saffari, M., Ebadi, A., & Ameryoun, A. (2017). Empowering Education: A New Model for In-service Training of Nursing Staff. *Journal of Advances in Medical Education & Professionalism*, 5(1), 26–32.
- Centers for Disease Control and Prevention (2018). Hepatitis C questions and answers for the public. Retrieved from <https://www.cdc.gov/hepatitis/hcv/cfaq.htm>
- Centers for Disease Control and Prevention (2020). The ABCs of hepatitis- for health professionals. Retrieved from <https://www.cdc.gov/hepatitis/resources/professionals/pdfs/abctable.pdf>
- Centers for Disease Control and Prevention (2021). Viral hepatitis surveillance- United States. Retrieved from <https://www.cdc.gov/hepatitis/policy/npr/2021/NationalProgressReport-HepC-ReduceInfectionsPWID.htm#:~:text=The%20rate%20of%20new%20hepatitis,of%202.1%20per%20100%2C000%20population.>
- Collins, K.M., Armenta, R.F., Cuevas-Mota, J., Liu, L., Strathdee, S.A., & Garfein, R.S. (2016). Factors associated with patterns of mobile technology use among persons who inject drugs. *Subst Abuse*, 37(4), 606-612. <https://doi.org/10.1080/08897077.2016.1176980>.
- Commonwealth of Kentucky Justice and Public Safety Cabinet (2020). 2020 Overdose Fatality Report- Kentucky Office of Drug Control Policy. Retrieved from

<https://odcp.ky.gov/Documents/2020%20KY%20ODCP%20Fatality%20Report%20%28final%29.pdf>

- Denniston, M.M., Klevens, R.M., McQuillan, G.M., & Jiles, R.B. (2012). Awareness of infection, knowledge of hepatitis C, and medical follow-up among individuals testing positive for hepatitis C: National Health and Nutrition Examination Survey 2001–2008. *Hepatology*, *55*, 1652–1661.
- Falade-Nwulia, O., Irvin, R., Merkow, A., Sulkowski, M., Niculescu, A., Olsen, Y., Stoller, K., Thomas, D. L., Latkin, C., & Mehta, S. H. (2019). Barriers and facilitators of hepatitis C treatment uptake among people who inject drugs enrolled in opioid treatment programs in Baltimore. *Journal of Substance Abuse Treatment*, *100*, 45–51. <https://doi.org/10.1016/j.jsat.2019.01.021>
- Faludi, A. (1987). *A Decision-Centered View of Environmental Planning*. Pergamon Press, Elmsford, New York.
- Ford, J.S., Chechi, T., Toosi, K., Mahmood, B., Meehleis, D., Otmar, M., Tran, N., & May, L. (2021). Universal screening for hepatitis C virus in the ED using a best practice advisory. *West J Emergency Medicine*, *22*(3), 719-725. doi:10.5811/westjem.2021.1.49667
- Franco, R.A., Overton, E.T., Tamhane, A.R., Forsythe, J.M., Rodgers, J.B., Schexnayder, J.K., Guthrie, D., Thogaripally, S., Zinski, A., Saag, M.S., Mugavero, M.J., Wang, H.E., & Galbraith, J.W. (2016). Characterizing failure to establish hepatitis C care of baby boomers diagnosed in the emergency department. *Open Forum Infectious Diseases*, *3*(4), 1-7. <https://doi.org/10.1093/ofid/ofw211>
- Galbraith, J. W., Anderson, E.S., Hsieh, Y-H., Franco, R.A., Donnelly, J.P., Rodgers, J.B., Schechter-Perkins, E.M., Thompson, W.W., Nelson, N.P., Rothman, R.E., & White, D.A.E. (2020) High prevalence of hepatitis C infection among adult patients at four urban emergency departments — Birmingham, Oakland, Baltimore, and Boston, 2015–2017. *Morbidity and Mortality Weekly Report*, *69*(19), 569–574. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6919a1.htm>

- Houri, I., Horowitz, N., Katchman, H., Weksler, Y., Miller, O., Deutsch, L., & Shibolet, O. (2020). Emergency department targeted screening for hepatitis C does not improve linkage to care. *World Journal of Gastroenterology*, 26(32), 4878–4888. <https://doi.org/10.3748/wjg.v26.i32.4878>
- James, J. (2021). Report: Kentucky overdose deaths increased nearly 50% in 2020. Retrieved from <https://www.wuky.org/local-regional-news/2021-08-03/report-kentucky-overdose-deaths-increased-nearly-50-in-2020>
- Lier, A.J., Smith, K., Odekon, K., Bronson, S., Taub, E., Tharakan, M., Kelly, G.J., Patel, P., & Marcos, L.A. (2019). Risk factors associated with linkage to care among suburban hepatitis C-positive baby boomers and injection drug users. *Infectious Diseases and Therapy*, 8, 417-428. <https://doi.org/10.1007/s40121-019-0249-y>.
- Lyons, M.S., Kunnathur, V.A., Rouster, S.D., Hart, K.W., Sperling, M.I., Fichtenbaum, C.J., & Sherman, K.E. (2016). Prevalence of diagnosed and undiagnosed hepatitis C in a Midwestern urban emergency department. *Clinical Infectious Diseases*, 62(9), 1066-1071.
- Moore, J.D. (2021). Analyzing and optimizing the performance of an adult emergency department hepatitis C virus screening and linkage to care program. University of Tennessee Haslam College of Business Physician Executive MBA.
- Schechter-Perkins, E.M., Miller, N.S., Hall, J., Hartmann, J.J., Dorfman, D.H., Andry, C., & Linas, B.P. (2018). Implementation and preliminary results of an emergency department, non-targeted opt-out hepatitis C virus screening program. *Academy of Emergency Medicine*, 25(11), 1216-1226. doi:10.1111/acem/13484.
- Sublette, V.A., Smith, S.K., George, J., McCaffery, K., Douglas, M.W. (2015). The hepatitis C treatment experience: Patients' perceptions of the facilitators of and barriers to uptake, adherence, and completion. *Psychology and Health*, 30(8), 987-1004. doi:10.1080/08870446.2015.1012195
- University of Kentucky UK HealthCare (2021). 2025 Strategic Plan. Retrieved from <https://ukhealthcare.uky.edu/sites/default/files/ukhealthcare-strategic-plan-2025.pdf>

U.S. Preventive Services Task Force (2020). Screening for hepatitis C virus infection in adolescents and adults. Retrieved from

<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/hepatitis-c-screening>

White, D.A.E., Anderson, E.S., Pfeil, S.K., Trivedi, T.K., & Alter, H.J. (2016). Results of a rapid hepatitis C virus screening and diagnostic testing program in an urban emergency department. *Annals of Emergency Medicine*, 67(1), 119-128.

World Health Organization (2021). Hepatitis C. Retrieved from <https://www.who.int/news-room/factsheets/detail/hepatitis-c>

## Appendices

### Appendix A: Departmental Letter of Support



July 21, 2021

RE: Carson Swartz, RN, DNP candidate

I would like to express my strong support for Carson Swartz's participation with the UK-EM ED based Hepatitis C Screening Program. Specifically, I support Carson's proposed study, "Increasing Staff Compliance with Routine HCV Screening and Evaluating Linkage to Care Among Patients Testing HCV Positive in the Emergency Department". This is an extremely novel program and HCV represents one of the greatest health threats that citizens in the commonwealth will face in the next twenty years and yet is now completely curable with low-risk oral medications. Nursing and provider education will be a key piece of the puzzle in the continued success of the program at UK but also in the opportunity to expand the program to other EDs across the state. Carson's project will help us optimize all steps in the process and we look forward to working with her in this endeavor. As chair of the Department of Emergency Medicine, I will ensure our providers give Carson the support she will require to successfully complete this project.

In summary, we completely support Carson Swartz's project, and we are excited to have her working on our team to improve the lives of our ED patients with HCV.

Sincerely,

A handwritten signature in black ink that reads "R. Humphries MD". The signature is written in a cursive style.

Roger L. Humphries, MD  
Professor and Chair

Department of Emergency Medicine

University of Kentucky • 800 Rose Street, M53 • Lexington, Kentucky 40536-0298  
Phone: 859-323-5908 • Fax: 859-323-8056 • [www.wildcatem.com](http://www.wildcatem.com)

## Appendix B: Nursing Letter of Support

# UK HealthCare

## UK Hospital

Carson Swartz, BSN, RN  
University of Kentucky  
College of Nursing  
751 Rose Street  
Lexington, KY 40536

July 12, 2021

RE: Carson Swartz

To Whom it May Concern,

I am delighted to provide a letter of support for your proposed study: "Increasing Staff Compliance with Routine HCV Screening and Evaluating Linkage to Care Among Patients Testing Hepatitis C Positive in the Emergency Department". The University of Kentucky is a Level I Trauma Center serving pediatric and adult patients from eastern and central Kentucky. This study is important to better understand what methods best promote care for a disease that is curable, and to improve nursing staff and provider education regarding hepatitis C testing processes in our department. The University of Kentucky Emergency Department would be pleased to serve as a site for the proposed study. I oversee emergency and trauma care conducted in our department and am willing to support your research staff's access to our staff for this study. Dr. Patricia Howard, Enterprise Director of Emergency Services, will provide access to your research staff for subject recruitment and meeting space to conduct the research sessions.

The proposed study is vitally important to identifying and treating patients with a curable disease. I look forward to working with you on this exciting project.

Sincerely,



Stephanie Carry, MSN, RN, CEN  
Patient Care Manager  
Emergency and Trauma Services  
University of Kentucky  
1000 S. Limestone St.  
Lexington, KY 40536  
O: 859-257-8869



## Appendix C: Graduate Medical Education Approval Letter



College of Medicine  
Graduate Medical Education

### MEMORANDUM

DATE: July 22, 2021

FROM: Katherine McKinney, MD  
Senior Associate Dean, Graduate Medical Education

TO: Carson Swartz, RN, BSN  
Principal Investigator

SUBJECT: House Staff participation in the IRB protocol entitled:  
"Increasing Staff Compliance with Routine HCV Screening and Evaluating Linkage to Care  
Among Patients Testing HCV Positive in the Emergency Department"

The Graduate Medical Education Committee members have reviewed this proposal and are in agreement with house staff participation in this study as outlined.

## Appendix D: Nursing Research Council Approval Letter



|  
September 01, 2021

Dear Carson G. Swartz,

Your proposal entitled, "Increasing Staff Compliance with Routine HCV Screening and Improving Linkage to Care Among Patients testing Hepatitis C Positive in the Emergency Department" was reviewed during our September 1st meeting of the Nursing Research Council at the University of Kentucky Medical Center, and we are happy to report that your proposal has been approved. If you have not yet obtained approval for your research through the University of Kentucky Institutional Review Board (IRB), you must complete this process as well.

The Nursing Research Council reviews all proposals to conduct scientific inquiry that involve UK nursing staff in an effort to assess for a number of indicators: to determine the feasibility of conducting the proposed research, to establish the level of support from nursing management or administration to conduct the research, to determine the applicability to nursing, to facilitate IRB review ensuring proper protections are present, and to assess the completeness of the proposal. If your proposal is amended in any way such that the methods or procedures are modified significantly, your proposal must be re-submitted for review by this Council. ***You are required to provide your IRB approval date, study status and completion date to this council for compliance with Magnet verification requirements.***

Please contact me if you need further assistance, have questions, or wish to discuss anything.

Sincerely,

Jonathan High RN, BSN, CCRN, RN-BC  
Chair, Nursing Research Council

Dirk A. Church, RN, BSN, CCRN  
Co-Chair, Nursing Research Council

### Office of the Executive Vice President for Health Affairs

University of Kentucky • 317 Wethington Building • 900 South Limestone • Lexington, Kentucky 40536-0200  
Phone: (859) 323-5126 • Fax: (859) 323-1918 • [www.ukhealthcare.uky.edu](http://www.ukhealthcare.uky.edu)

## Appendix E: Cover Letter

### COVER LETTER

#### Hepatitis C Testing Processes in the Emergency Department Study

Dear potential research participant:

Researchers at the University of Kentucky are inviting you to take part in an online survey and optional in-service education sessions about current hepatitis C testing and follow-up processes in the emergency department. You are receiving this letter because you have been identified as being currently employed as a patient care provider at the University of Kentucky Emergency Department. The purpose of this survey is to determine staff perceptions and knowledge regarding the current hepatitis C testing program at the University of Kentucky Emergency Department, and to educate healthcare providers about the program and follow-up procedures during a departmental in-service that staff will only need to attend once if they choose to volunteer for the study. Following the in-service, providers will retake the same survey described above to reevaluate knowledge and perceptions before and after the educational intervention.

Although you may not receive personal benefit from taking part in this research study, your responses may help us understand more about staff perceptions of current workflows as they pertain to hepatitis C testing, as well as effective interventions aimed at increasing provider knowledge and compliance with this crucial testing program. Some volunteers experience satisfaction from knowing they have contributed to research that may possibly benefit others in the future.

Taking part in this study is voluntary. If you choose not to participate, there will be no penalty or loss of benefits to which you are otherwise entitled. People choosing not to participate will not face any repercussions pertaining to employment status.

It will take approximately 5 minutes to complete each survey/ questionnaire, and participation in the in-person ED in-service will take approximately 8-10 minutes. There are no known risks in participating in this study.

Your response to the survey is anonymous, meaning no names will appear or be used on research documents, or be used in presentations or publications which means no names, IP addresses, email addresses, or any other identifiable information will be collected with the survey responses. The researcher will not know that any information you provided came from you, nor whether you participated in the study.

We hope to receive completed surveys from around one hundred staff, so your answers are important to us. Of course, you have a choice about whether or not to complete the survey, but if you do choose to participate, you are free to skip any questions or discontinue at any time.

Please be aware that while we make every effort to safeguard your data once received from the online survey company and from our servers via REDCap, given the nature of online surveys, as with anything involving the Internet, we can never guarantee the confidentiality of the data while still on the survey company's servers, or while en route to either them or us. It is also possible the raw data collected for research purposes will be used for marketing or reporting purposes by the survey/ data gathering company after the research is concluded, depending on the company's Terms of Service and Privacy policies.

If you have any questions about the study, feel free to contact me at the contact information provided below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the University of Kentucky Office of Research Integrity at 859-257-9428 or toll-free at 1-866-400-9428.

Thank you in advance for your assistance with this important project. Each survey will remain open for response completion four weeks after survey link distribution.

By completing this survey, you are indicating that you are at least 18 years old, have read and understood this consent form, and agree to voluntarily participate in this research study.

Sincerely,

Carson Swartz, BSN, RN

College of Nursing, University of Kentucky

PHONE: 859-749-8774

E-MAIL: [carson.swartz@uky.edu](mailto:carson.swartz@uky.edu)

Carson Swartz is a graduate nursing student in the Department of Nursing Instruction. She is being guided in this research by Sheila Melander, PhD, APRN, ACNP-BC, FCCM, FAANP, FAAN.

## Appendix F: IRB Approval

IRB Approval  
10/7/2021  
IRB # 70414  
IRB6

### PROTOCOL TYPE

Which IRB

Medical  NonMedical

Protocol Process Type

Exemption  
 Expedited (Must be risk level 1)  
 Full

**IMPORTANT NOTE:** Once you have saved your choices under "Which IRB" and "Protocol Process Type", you will not be able to change your selections. If you select the wrong IRB Type and/or your application is deemed eligible for a different Protocol Process Type, it may be necessary to create a new application.

Please see below for guidance on which selections to make, and/or go to ORI's "[Getting Started](#)" web page. If you still have questions about which IRB or Protocol Process Type to choose, please contact the Office of Research Integrity (ORI) at 859-257-9428 **prior** to saving your selections.

#### \*Which IRB\*

The **Medical IRB** reviews research emanating from the Colleges of Dentistry; Health Sciences; Medicine; Nursing; Pharmacy and Health Sciences; and Public Health.

The **Nonmedical IRB** reviews research originating from the Colleges of Agriculture; Arts & Sciences; Business & Economics; Communication & Information; Design; Education; Engineering; Fine Arts; Law; and Social Work. The Nonmedical IRB does not review studies that involve administration of drugs, testing safety or effectiveness of medical devices, or studies that involve invasive medical procedures, regardless of from what college the application originates.

#### \*Which Protocol Process Type\*

Under federal regulations, an investigator's application to conduct a research project involving human subjects can be processed by the IRBs in three ways:

- by full review;
- by exemption certification;
- by expedited review.

The preliminary determination that a research project is eligible for exemption certification or expedited review is made by the investigator. For assistance in determining which review process type your IRB application is eligible for, please go to ORI's "[Getting Started](#)" web page.

The revised Common Rule expanded exemption certification category 4 for certain secondary research with identifiable information or biospecimens. The regulations no longer require the information or biospecimens to be existing. For more information see the [Exemption Categories Tool](#).

## Appendix G: Survey Tool

Q1. When the Best Practice Advisory below appears, what is **typically** your next action? Select all that apply to your specific workflow:

BestPractice Advisory -

**Important (1)**

It's our departments policy to order an HIV and HCV Screening test; our consent form includes this screening.

If patient has a negative result within the last year; do not order the applicable test(s), select "Patient has negative test within last year" below.

ⓘ If patient has no results or negative results more than 1 year old, order the appropriate test(s).

Patients should be screened annually for HIV unless a positive result is on file.  
Patients should be screened annually for HCV unless a positive result is on file.

**The ED HCV/HIV linkage to care team will follow up on all positive results.**

Last RAPDHIV1X2: Not on file  
Last HIVRNA: Not on file  
Last HEC: Not on file  
Last HCVRNA: Not on file

<input type="checkbox"/> Order	<input type="checkbox"/> Do Not Order	<a href="#">Gilead Hepatitis C Antibody</a>
<input type="checkbox"/> Order	<input type="checkbox"/> Do Not Order	<a href="#">ED Protocol - HIV 1/2 Antibody/Antigen Screen</a>

Acknowledge Reason \_\_\_\_\_

Accept  Dismiss

- I order both tests & do not inform the patient that they will be tested
- I order both tests after I inform the patient of the routine screening program (given they provide consent)
- I ask the patient if they've had a negative HCV test within the last year before ordering
- I sometimes order the test depending on the patient's chief complaint
- If I feel too busy, I will skip the test to lessen my workload
- I never order the test

Q2. How confident are you when telling a patient that they will be tested for hepatitis C as a routine screening procedure?

- Not confident
- Somewhat confident
- Fairly confident
- Very confident
- I don't tell the patient

Q3. How important do you think it is to screen our specific patient population for hepatitis C?

- Not important
- Somewhat important
- Very important

Q4. Do you feel like ordering and completing HCV testing disrupts your workflow?

- Yes
- Sometimes
- No
- I never do this

Q5. Do you order and complete the HCV test on EVERY patient?

- Yes

- Sometimes
- No

Q6. How often do you skip HCV testing?

- Always
- Often
- Sometimes
- Rarely
- Never

Q7. How often have you observed your patients be given the hepatitis C follow-up informational packet when they have tested positive?

- Always
- Often
- Sometimes
- Rarely
- Never

Q8. Do you feel comfortable relaying positive hepatitis C test results to a patient and distributing resource packets?

- Yes, I feel comfortable
- No, I don't feel comfortable
- I don't tell the patient

Q9. Is hepatitis C curable?

- Yes
- No

Q10. Approximately how many patients have we diagnosed as HCV RNA+ since 2018?

- < 1,000
- 1,000-3,000
- 3,000-5,000
- > 5,000

Q11. Approximately how many patients diagnosed with hepatitis C have attended a follow-up appointment?

- < 50
- 200-400
- 400-600
- > 600

Q12. What is your current role in the emergency department?

- Registered Nurse
- Advanced Practice Provider
- Resident Physician
- Attending Physician

Q13. Do you have any feedback or suggestions regarding the HCV/ HIV testing program?

## Tables

**Table 1. Sample Population Demographics**

Role in ED	Pre-education ( <i>n</i> = 49) <i>n</i> (%)	Post-education ( <i>n</i> = 48) <i>n</i> (%)	<i>p</i> -value
Registered nurse	31 (63.3%)	21 (43.8%)	.29
Advanced Practice Provider	5 (10.2%)	8 (16.7%)	
Resident Physician	3 (6.1%)	4 (8.3%)	
Attending Physician	10 (20.4%)	15 (31.3%)	

**Table 2: ED Staff Survey Responses**

	Response options	Pre-education ( <i>n</i> = 48) <i>Mean</i> (SD)	Post-education ( <i>n</i> = 47) <i>Mean</i> (SD)	<i>p</i> -value
<b>HCV Knowledge Items</b>	0-3	1.44 (0.85)	1.77 (0.81)	.057
<b>Confidence in telling a patient that they will be tested for HCV</b>	1-5	3.18 (1.4)	3.83 (1.2)	.016
<b>Perceived importance of testing UKED's patient population for HCV</b>	1-3	2.67 (0.56)	2.88 (0.39)	.042
<b>Perceived disruption in workflow when testing for HCV</b>	1-3	2.31 (1.05)	2.52 (0.65)	.234
<b>Frequency of skipping HCV consent/ testing</b>	1-5	3.42 (0.85)	2.49 (1.16)	0.36

**Table 3: Test-Ordering Frequency**

Response	Pre-education Frequency <i>n</i> = 48 <i>n</i> (%)	Post-education Frequency <i>n</i> = 48 <i>n</i> (%)	<i>p</i> -value
I SOMETIMES or ALWAYS order the test	28 (58%)	38 (79%)	.028
I never order the test	20 (42%)	10 (21%)	

**Table 4: HCV Testing & LTC Trends (Oct. 2021- March 2022)**

Month	Patients Screened	HCV Ab+	HCV Ab+ Rate (%)	HCV RNA+	HCV RNA+ Rate (%)	Linkage to Care Rate (%)
October '21 days reported: 31	5,485	123	8.7%	58	45.7%	27.6%
November '21 days reported: 30	5,382	108	8.7%	54	50.0%	45.1%
December '21 days reported: 31	5,604	118	8.3%	53	47.7%	34.0%
January '22 days reported: 31	5,524	102	7.8%	39	38.6%	28.2%
February '22 days reported: 28	4,707	100	8.9%	56	56.0%	16.4%
March '22 days reported: ** 12	2,212	56	8.4%	29	54.7%	0.0%



Figures

Figure 1: Educational Flyer (English)

**GET TESTED. GET TREATED.  
ELIMINATE HEPATITIS C**

hepatitis C is a blood-borne disease that can cause **LIVER FAILURE & LIVER CANCER**

**75%** of people living with hepatitis C do not know they are infected

**UK HealthCare**

THIS TEST IS 1 SIMPLE BLOOD DRAW

**FREE OF CHARGE**

a healthcare provider will contact you with **RESOURCES FOR TREATMENT** if your test comes back positive

new medications can **cure** more than **90%** of people with hepatitis C

**MOST PEOPLE CAN BE CURED IN 12 WEEKS** WITH MINIMAL SIDE EFFECTS

Figure 2: Educational Flyer (Spanish)

**HAZTE LA PRUEBA. RECIBE TRATAMIENTO.  
ELIMINA LA HEPATITIS C**

La hepatitis C es una enfermedad de transmisión sanguínea que puede provocar **INSUFICIENCIA HEPÁTICA Y CÁNCER DE HÍGADO**

**75%** de las personas con hepatitis C no saben que están infectadas

**UK HealthCare**

LA PRUEBA CONSISTE EN UNA SOLA MUESTRA DE SANGRE

**SIN COSTO ALGUNO**

Si sale positiva un proveedor de salud le contactará con **RECURSOS PARA TRATAMIENTO**

Hay nuevas medicinas que pueden **curar** más del **90%** de las personas con hepatitis C

LA MAYORÍA DE LAS PERSONAS SE PUEDEN CURAR DENTRO DE **12 SEMANAS** CON POCOS EFECTOS SECUNDARIOS

**Figure 3: HCV Best Practice Advisory Actions**

